Patent
Attorney Docket No. 10012257-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of
Yasusi Kanada et al.
Application No.: 09/842,130
Filing Date: April 26, 2001
Title: METHOD AND SYSTEM FOR CONTROLLING A POLICY-BASED NETWORK

ATTN: DRAFTING BRANCH
Allowed:
Group Art Unit:
Examiner:
Confirmation No.:

SUBMISSION OF DRAWINGS

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Commissioner for Patents
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Sir:

Enclosed please find 21 sheet(s) of drawings for review by the Patent and Trademark Office. Should the enclosed drawing(s) require changes, it is respectfully requested that the Patent and Trademark Office notify the undersigned of same.

Respectfully submitted,

BUCHANAN INGERSOLL PC

By _____
Patrick C. Keane
Registration No. 32,858

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: September 27, 2005

PAGE 5/26 * RCVD AT 9/27/2005 2:17:36 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2733919 * CSID: * DURATION (mm-ss):04-56

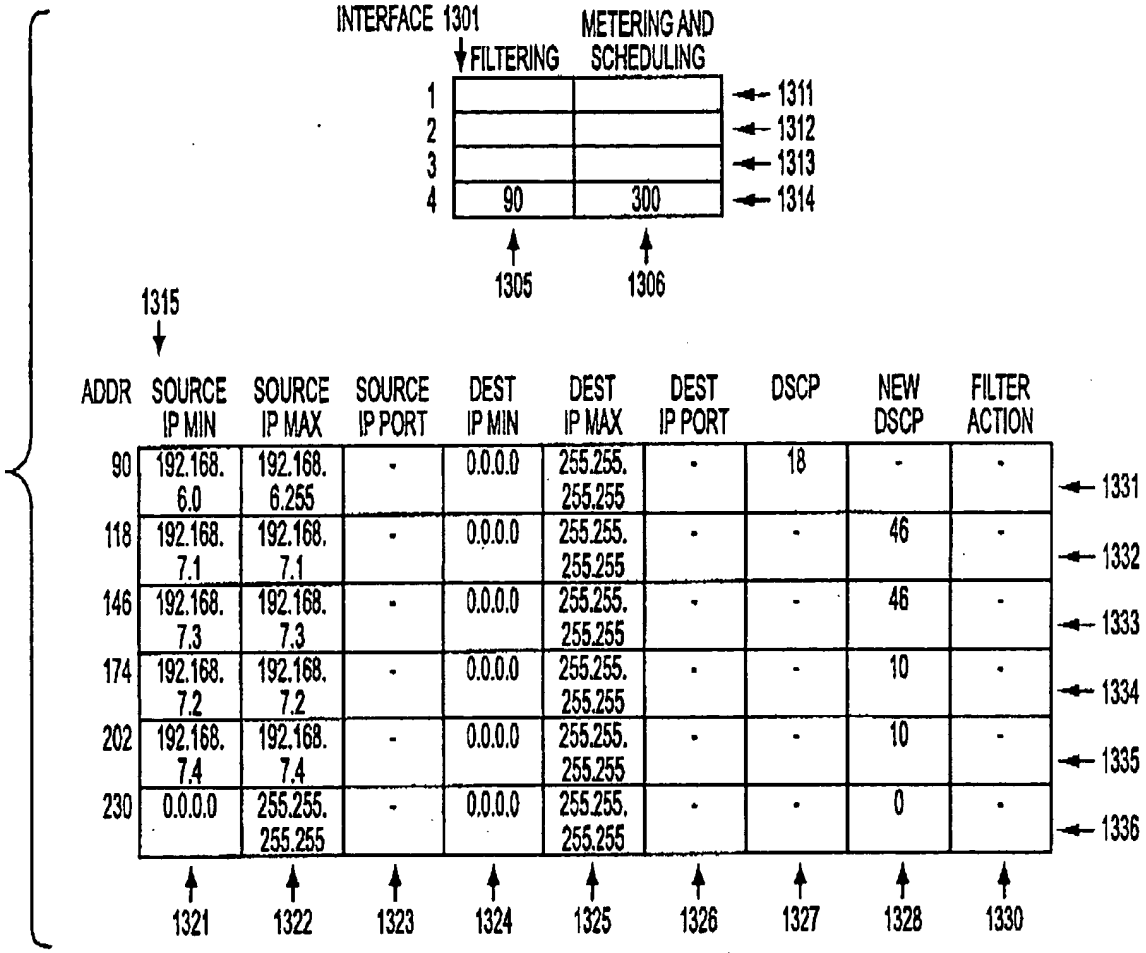
INTERFACE 1301
FILTERING
METERING AND SCHEDULING
1
2
3
4
90
300
1311
1312
1313
1314
1305
1306
1315
ADDR
SOURCE IP MIN
SOURCE IP MAX
SOURCE IP PORT
DEST IP MIN
DEST IP MAX
DEST IP PORT
DSCP
NEW DSCP
FILTER ACTION
90 192.168.6.0 192.168.6.255 - 0.0.0.0 255.255.255.255 - 18 - -
118 192.168.7.1 192.168.7.1 - 0.0.0.0 255.255.255.255 - - 46 -
146 192.168.7.3 192.168.7.3 - 0.0.0.0 255.255.255.255 - - 46 -
174 192.168.7.2 192.168.7.2 - 0.0.0.0 255.255.255.255 - - 10 -
202 192.168.7.4 192.168.7.4 - 0.0.0.0 255.255.255.255 - - 10 -
230 0.0.0.0 255.255.255.255 - 0.0.0.0 255.255.255.255 - - 0 -
1331
1332
1333
1334
1335
1336
1321
1322
1323
1324
1325
1326
1327
1328
1330

FIG. 13A

1316

ADDR	SOURCE IP MIN	SOURCE IP MAX	SOURCE IP PORT	DEST IP MIN	DEST IP MAX	DEST IP PORT	DSCP	INFO. RATE	IN QUEUE	OUT DSCP	OUT QUEUE	OUT DROP
300	192.168. 6.0	192.168. 6.255	-	0.0.0.0	255.255. 255.255	-	18	-	5	-	-	-
332	0.0.0.0	255.255. 255.255	-	0.0.0.0	255.255. 255.255	-	46	1000	6	-	-	DROP
364	192.168. 7.2	192.168. 7.2	-	0.0.0.0	255.255. 255.255	-	10	-	5	-	-	-
396	192.168. 7.4	192.168. 7.4	-	0.0.0.0	255.255. 255.255	-	10	-	5	-	-	-
428	0.0.0.0	255.255. 255.255	-	0.0.0.0	255.255. 255.255	-	-	-	2	-	-	-
	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352

FIG. 13B 14

1501 1502

814

INTERFACE	ADDRESS	SCHEDLALG	
1	-	-	1511
2	-	-	1512
3	-	-	1513
4	-	PRIORITYSCHEDL	1514

FIG. 15

Appln. Filing Date: April 26, 2001
Title: METHOD AND SYSTEM FOR CONTROLLING A POLICY-BASED NETWORK
Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 1 of 21

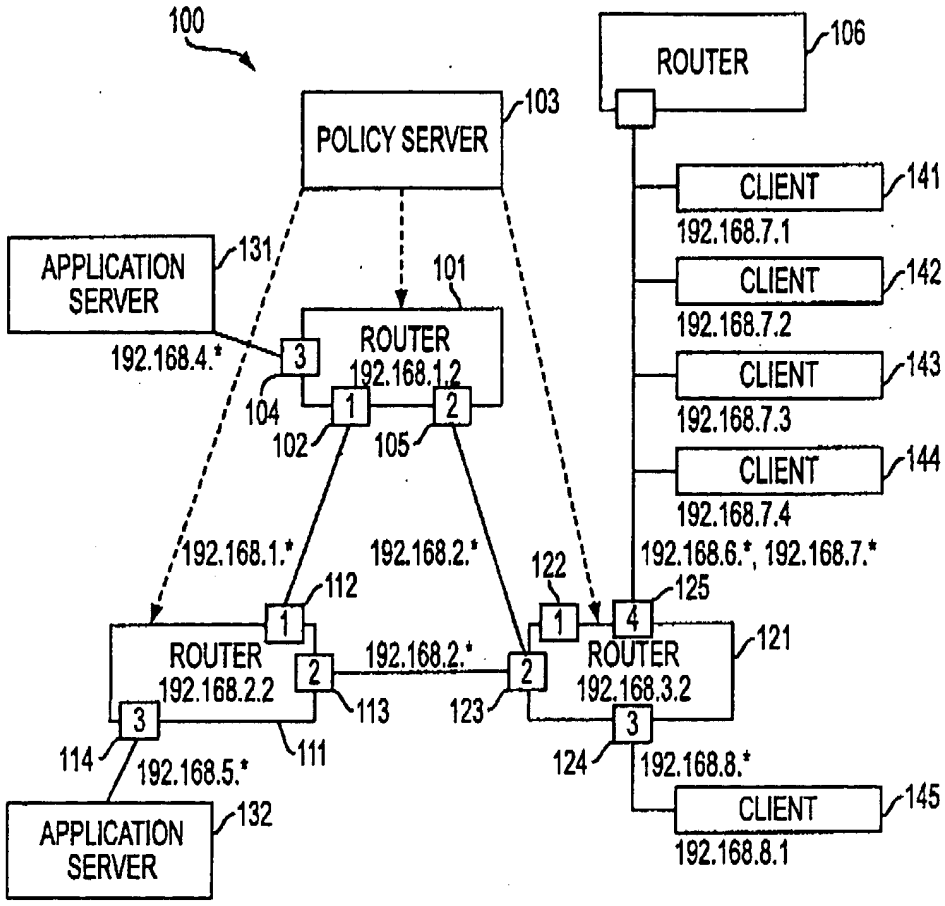

FIG. 1

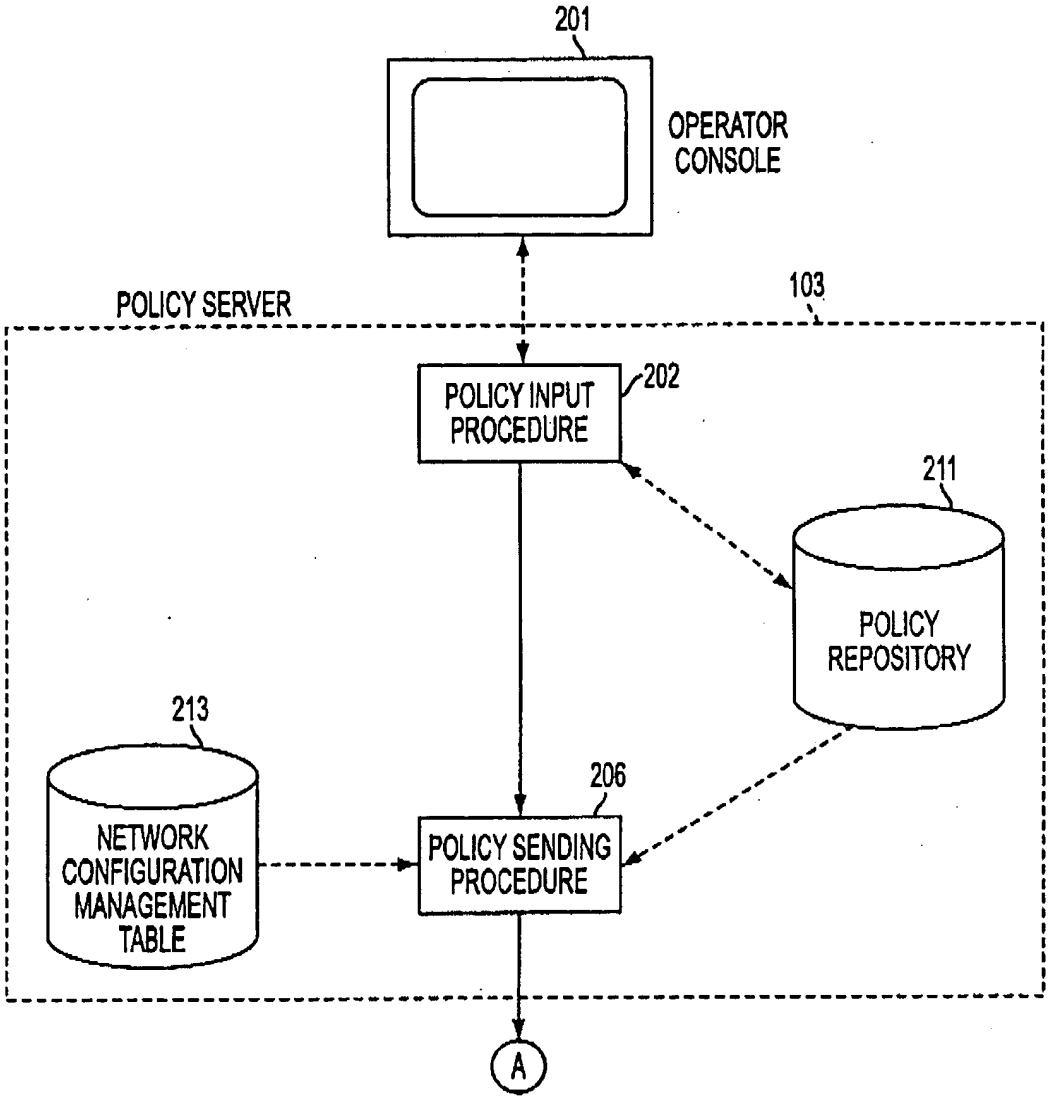
201
OPERATOR CONSOLE
POLICY SERVER
103
POLICY INPUT PROCEDURE
202
211
POLICY REPOSITORY
213
NETWORK CONFIGURATION MANAGEMENT TABLE
206
POLICY SENDING PROCEDURE
A

FIG. 2

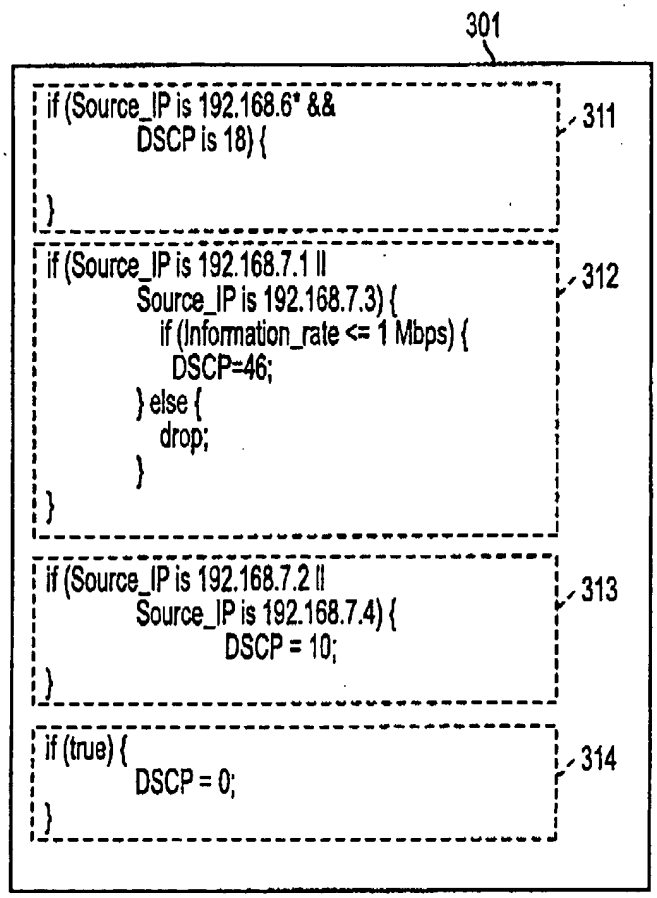
301
if (Source_IP is 192.168.6* &&
DSCP is 18) {
}
311
if (Source_IP is 192.168.7.1 ||
Source_IP is 192.168.7.3) {
if (Information_rate <= 1 Mbps) {
DSCP=46;
} else {
drop;
}
}
312
if (Source_IP is 192.168.7.2 ||
Source_IP is 192.168.7.4) {
DSCP = 10;
}
313
if (true) {
DSCP = 0;
}
314

FIG. 3A

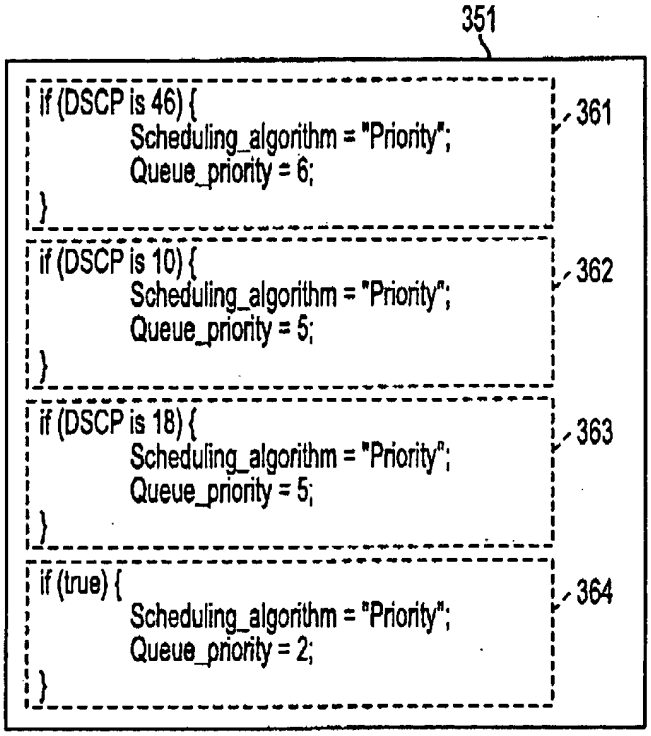
351
if (DSCP is 46) {
Scheduling_algorithm = "Priority";
Queue_priority = 6;
}
361
if (DSCP is 10) {
Scheduling_algorithm = "Priority";
Queue_priority = 5;
}
362
if (DSCP is 18) {
Scheduling_algorithm = "Priority";
Queue_priority = 5;
}
363
if (true) {
Scheduling_algorithm = "Priority";
Queue_priority = 2;
}
364

FIG. 3B

Appln. Filing Date: April 26, 2001
Title: METHOD AND SYSTEM FOR CONTROLLING A POLICY-BASED NETWORK
Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 5 of 21

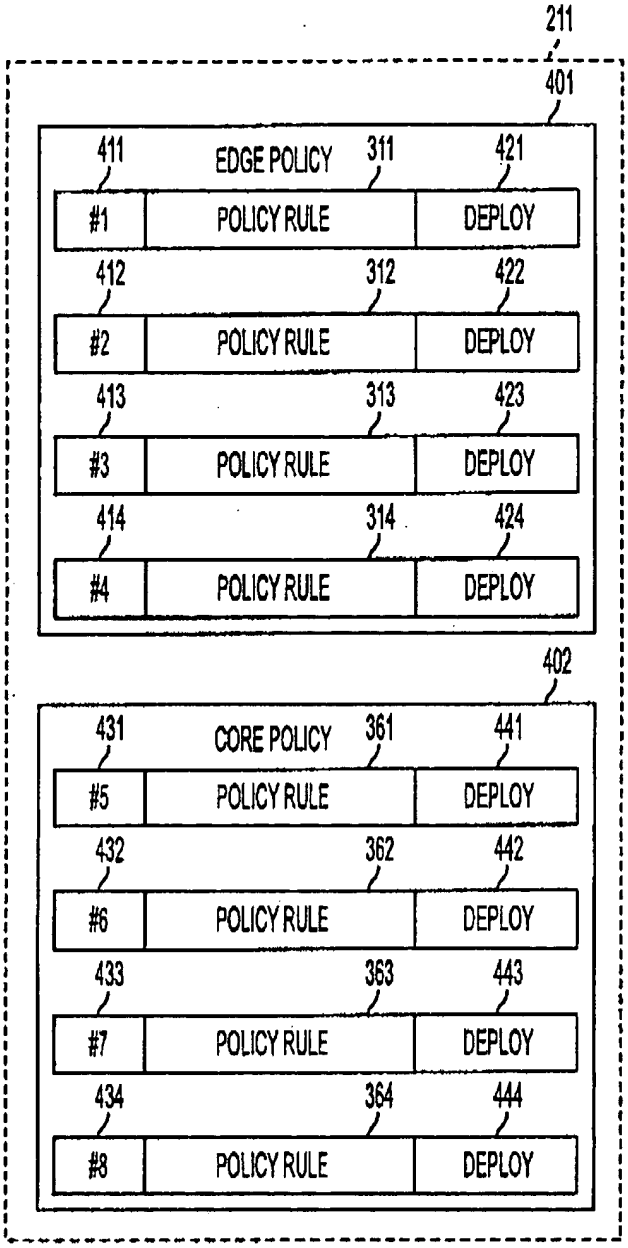

FIG. 4

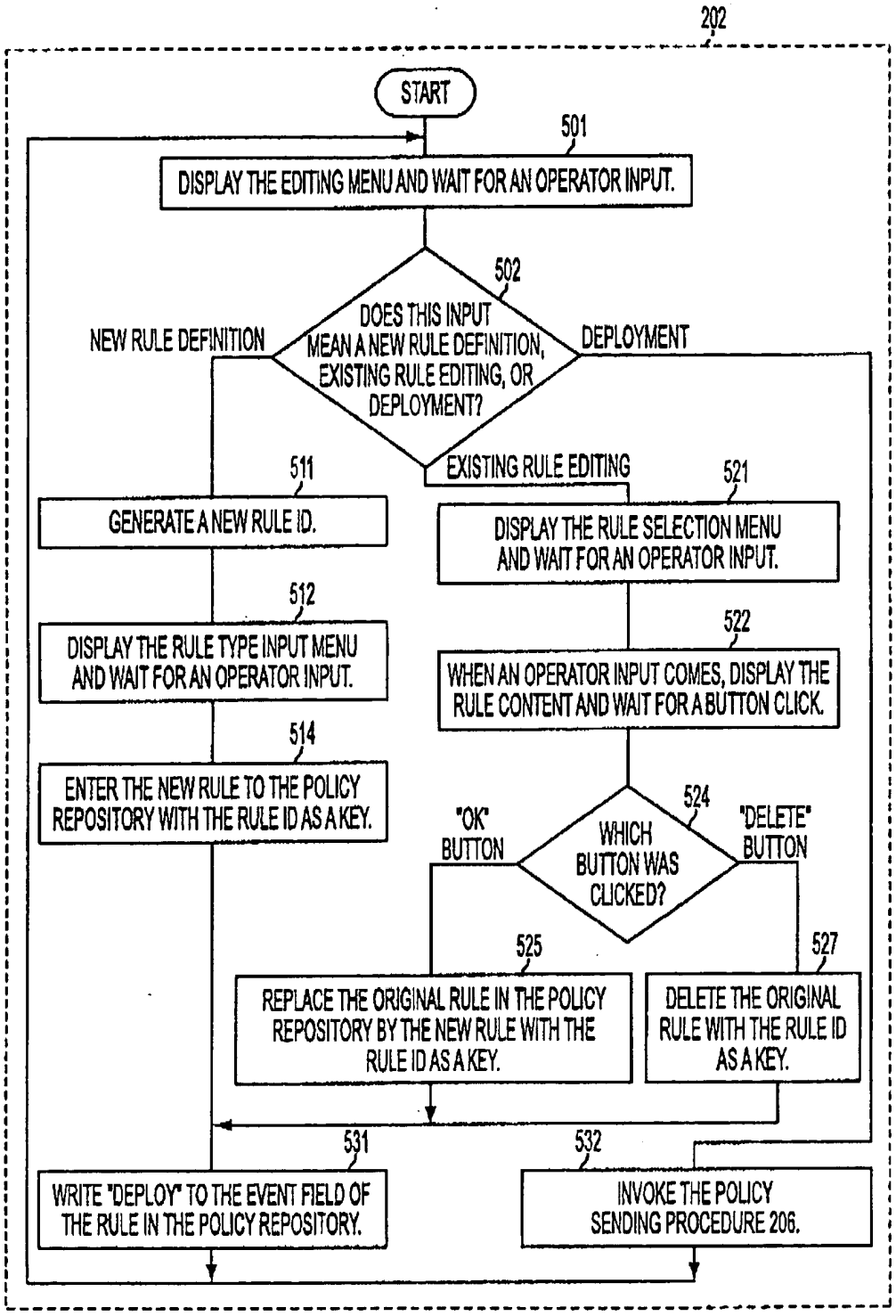
202
START
501
DISPLAY THE EDITING MENU AND WAIT FOR AN OPERATOR INPUT.
502
DOES THIS INPUT MEAN A NEW RULE DEFINITION, EXISTING RULE EDITING, OR DEPLOYMENT?
NEW RULE DEFINITION
EXISTING RULE EDITING
DEPLOYMENT
511
GENERATE A NEW RULE ID.
512
DISPLAY THE RULE TYPE INPUT MENU AND WAIT FOR AN OPERATOR INPUT.
514
ENTER THE NEW RULE TO THE POLICY REPOSITORY WITH THE RULE ID AS A KEY.
521
DISPLAY THE RULE SELECTION MENU AND WAIT FOR AN OPERATOR INPUT.
522
WHEN AN OPERATOR INPUT COMES, DISPLAY THE RULE CONTENT AND WAIT FOR A BUTTON CLICK.
524
WHICH BUTTON WAS CLICKED?
"OK" BUTTON
"DELETE" BUTTON
525
REPLACE THE ORIGINAL RULE IN THE POLICY REPOSITORY BY THE NEW RULE WITH THE RULE ID AS A KEY.
527
DELETE THE ORIGINAL RULE WITH THE RULE ID AS A KEY.
531
WRITE "DEPLOY" TO THE EVENT FIELD OF THE RULE IN THE POLICY REPOSITORY.
532
INVOKE THE POLICY SENDING PROCEDURE 206.

FIG. 5

212

TARGET IP	ROUTER IP	INTERFACE	
192.168.4.*	192.168.1.2	3	← 602
192.168.5.*	192.168.2.2	3	← 603
192.168.6.*	192.168.3.2	4	← 604
192.168.7.*	192.168.3.2	4	← 605
↑ 611	↑ 612	↑ 613	

FIG. 6

1111

RULE ID	POLICY TYPE	RULE	INTERFACE	CODEP	
#1	EDGE	→ 311	4	90	← 1011
#2	EDGE	→ 312	4	118	← 1012
#3	EDGE	→ 313	4	174	← 1013
#4	EDGE	→ 314	1,2,3,4	230	← 1014
#5	CORE	→ 361	1,2,3,4	332	← 1015
#6	CORE	→ 362	1,2,3,4	364	← 1016
#7	CORE	→ 363	1,2,3,4	300	← 1017
#8	CORE	→ 364	1,2,3,4	428	← 1018
↑ 1021	↑ 1022	↑ 1023	↑ 1024	↑ 1025	

FIG. 10

1101

LABEL TYPE	LABEL VALUE	DEFINING RULE	REFERRING RULE	
DSCP	18	#1	#7	← 1111
DSCP	46	#2	#5	← 1112
DSCP	10	#3	#6	← 1113
DSCP	0	#3	#8	← 1114
↑ 1121	↑ 1122	↑ 1123	↑ 1124	

FIG. 11

REPLACEMENT SHEET
Appln. Filing Date: April 26, 2001
Title: METHOD AND SYSTEM FOR CONTROLLING A POLICY-BASED NETWORK
Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 8 of 21

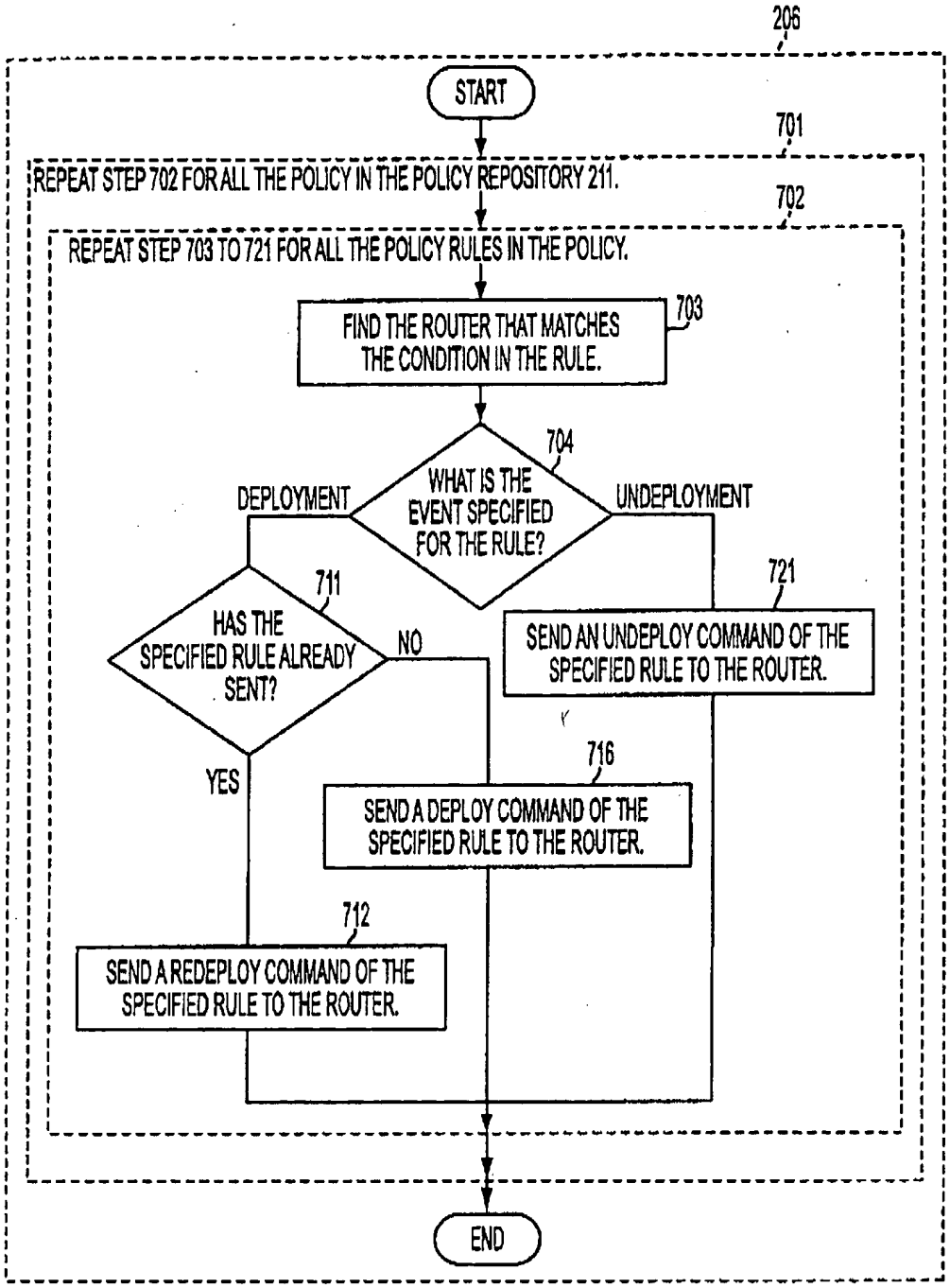

FIG. 7

Appln. Filing Date: April 26, 2001
Title: METHOD AND SYSTEM FOR CONTROLLING A POLICY-BASED NETWORK
Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 9 of 21

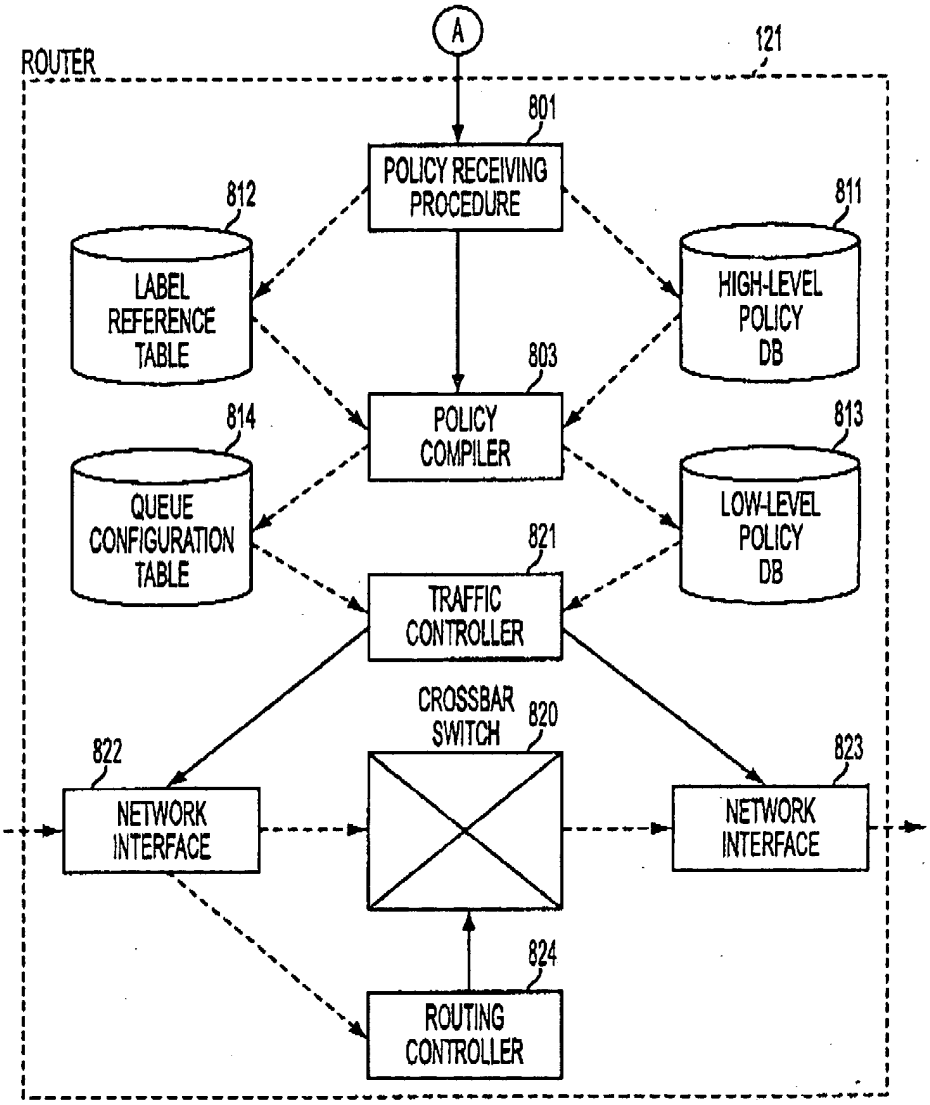

FIG. 8

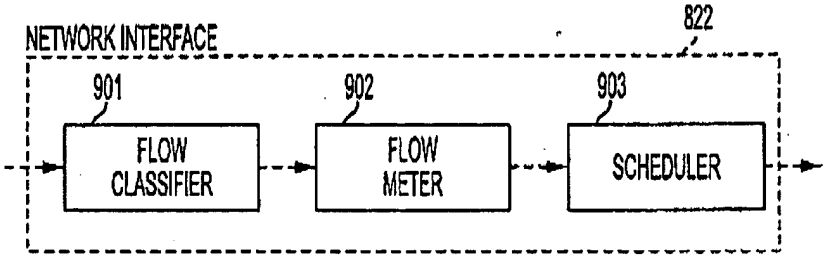

FIG. 9

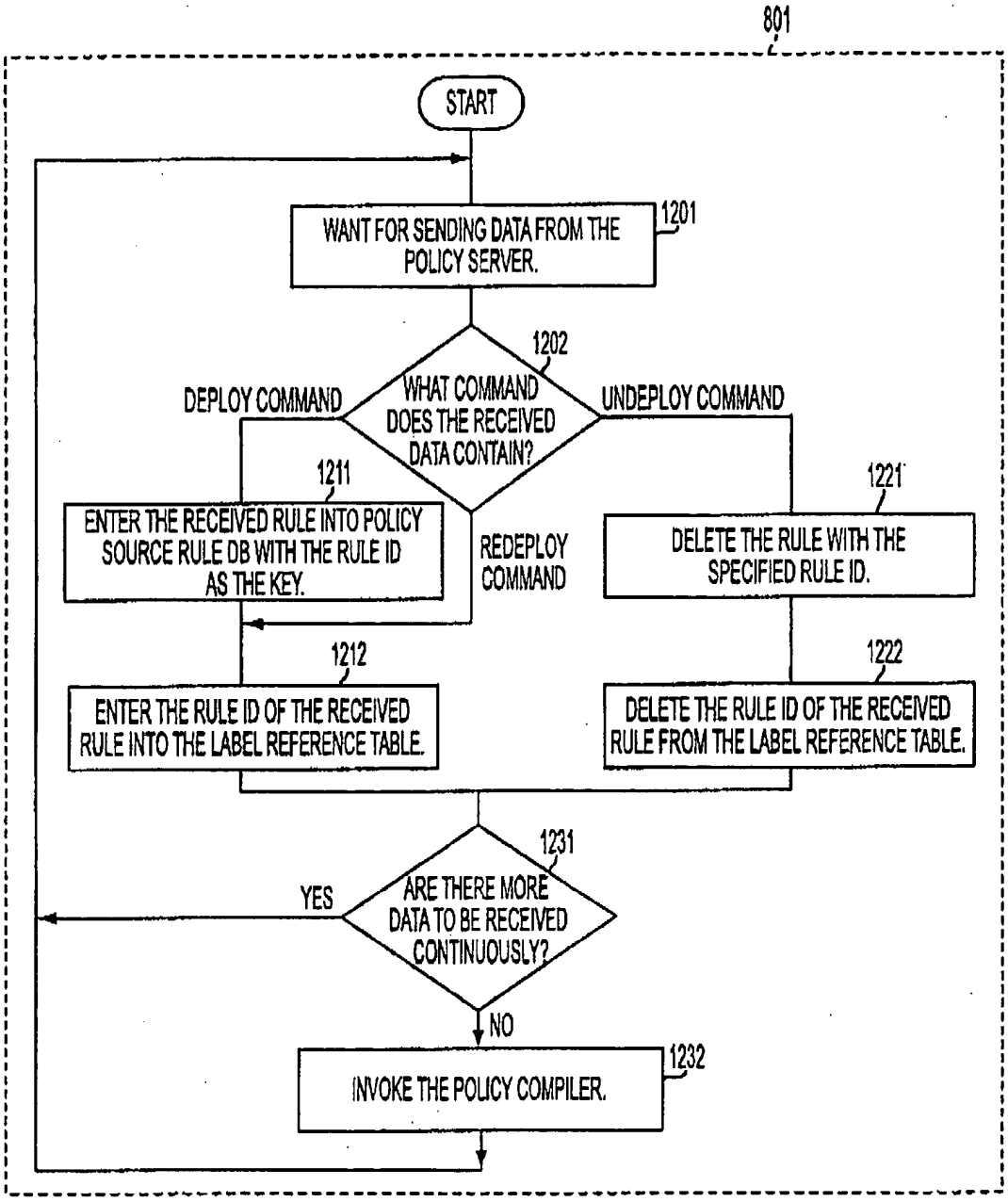
801
START
WANT FOR SENDING DATA FROM THE POLICY SERVER.
1201
1202
WHAT COMMAND DOES THE RECEIVED DATA CONTAIN?
DEPLOY COMMAND
REDEPLOY COMMAND
UNDEPLOY COMMAND
1211
ENTER THE RECEIVED RULE INTO POLICY SOURCE RULE DB WITH THE RULE ID AS THE KEY.
1212
ENTER THE RULE ID OF THE RECEIVED RULE INTO THE LABEL REFERENCE TABLE.
1221
DELETE THE RULE WITH THE SPECIFIED RULE ID.
1222
DELETE THE RULE ID OF THE RECEIVED RULE FROM THE LABEL REFERENCE TABLE.
1231
ARE THERE MORE DATA TO BE RECEIVED CONTINUOUSLY?
YES
NO
INVOKE THE POLICY COMPILER.
1232

FIG. 12

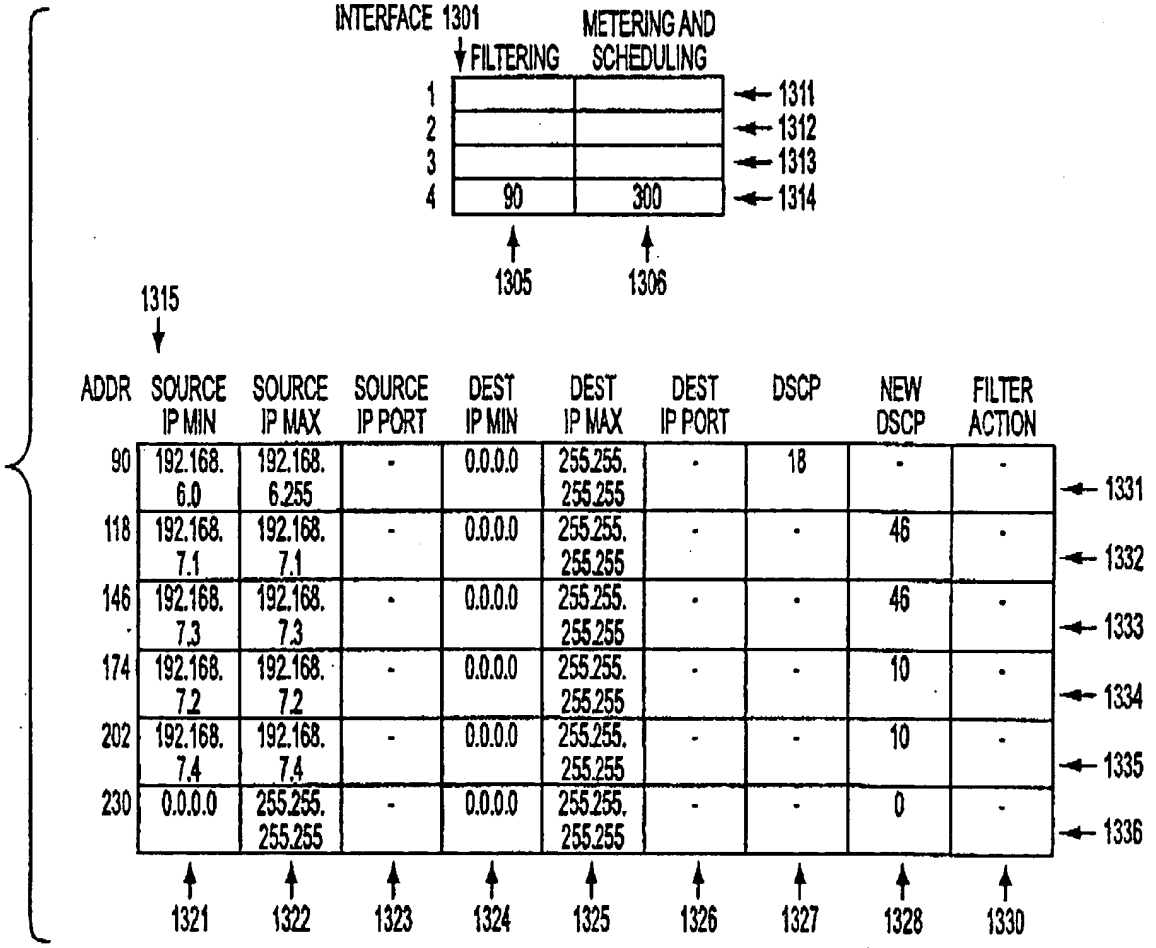
INTERFACE 1301
FILTERING
METERING AND SCHEDULING
1
2
3
4
90
300
1311
1312
1313
1314
1305
1306
1315
ADDR
SOURCE IP MIN
SOURCE IP MAX
SOURCE IP PORT
DEST IP MIN
DEST IP MAX
DEST IP PORT
DSCP
NEW DSCP
FILTER ACTION
90 192.168.6.0 192.168.6.255 - 0.0.0.0 255.255.255.255 - 18 - -
118 192.168.7.1 192.168.7.1 - 0.0.0.0 255.255.255.255 - - 46 -
146 192.168.7.3 192.168.7.3 - 0.0.0.0 255.255.255.255 - - 46 -
174 192.168.7.2 192.168.7.2 - 0.0.0.0 255.255.255.255 - - 10 -
202 192.168.7.4 192.168.7.4 - 0.0.0.0 255.255.255.255 - - 10 -
230 0.0.0.0 255.255.255.255 - 0.0.0.0 255.255.255.255 - - 0 -
1331
1332
1333
1334
1335
1336
1321
1322
1323
1324
1325
1326
1327
1328
1330

FIG. 13

Appln. Filing Date: April 26, 2001
Title: METHOD AND SYSTEM FOR CONTROLLING A POLICY-BASED NETWORK
Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 12 of 21

1316

ADDR	SOURCE IP MIN	SOURCE IP MAX	SOURCE IP PORT	DEST IP MIN	DEST IP MAX	DEST IP PORT	DSCP	INFO. RATE	IN QUEUE	OUT DSCP	OUT QUEUE	OUT DROP
300	192.168. 6.0	192.168. 6.255	-	0.0.0.0	255.255. 255.255	-	18	-	5	-	-	-
332	0.0.0.0	255.255. 255.255	-	0.0.0.0	255.255. 255.255	-	46	1000	6	-	-	DROP
364	192.168. 7.2	192.168. 7.2	-	0.0.0.0	255.255. 255.255	-	10	-	5	-	-	-
396	192.168. 7.4	192.168. 7.4	-	0.0.0.0	255.255. 255.255	-	10	-	5	-	-	-
428	0.0.0.0	255.255. 255.255	-	0.0.0.0	255.255. 255.255	-	-	-	2	-	-	-
	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352

FIG. 14

814 INTERFACE	1501 ADDRESS	1502 SCHEDL ALG	
1	-	-	1511
2	-	-	1512
3	-	-	1513
4	-	PRIORITYSCHEDL	1514

FIG. 15

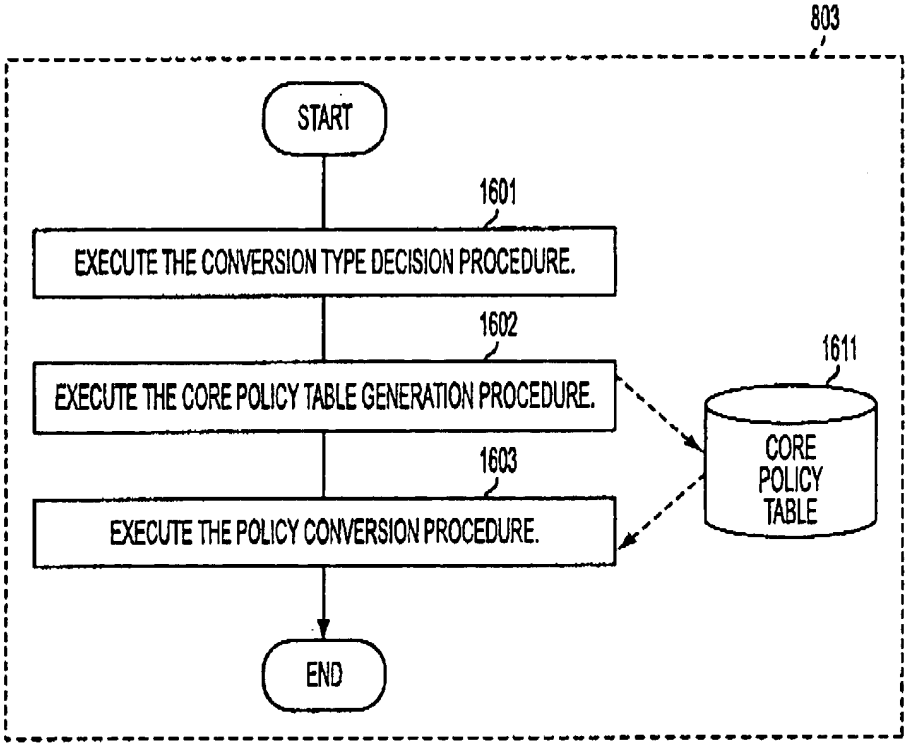
803
START
1601
EXECUTE THE CONVERSION TYPE DECISION PROCEDURE.
1602
EXECUTE THE CORE POLICY TABLE GENERATION PROCEDURE.
1611
CORE POLICY TABLE
1603
EXECUTE THE POLICY CONVERSION PROCEDURE.
END

FIG. 16

Appln. Filing Date: April 26, 2001
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Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 14 of 21

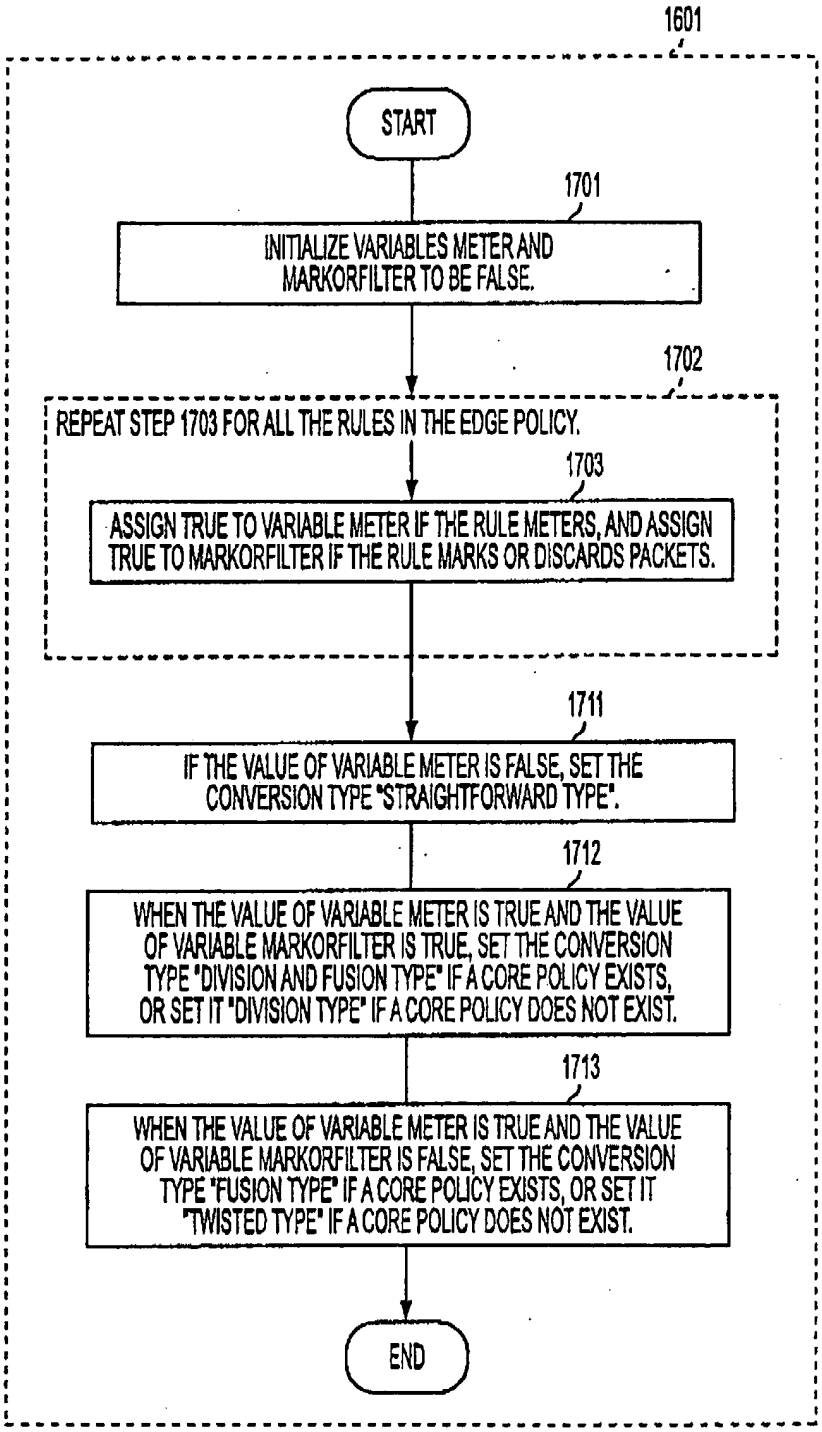

FIG. 17

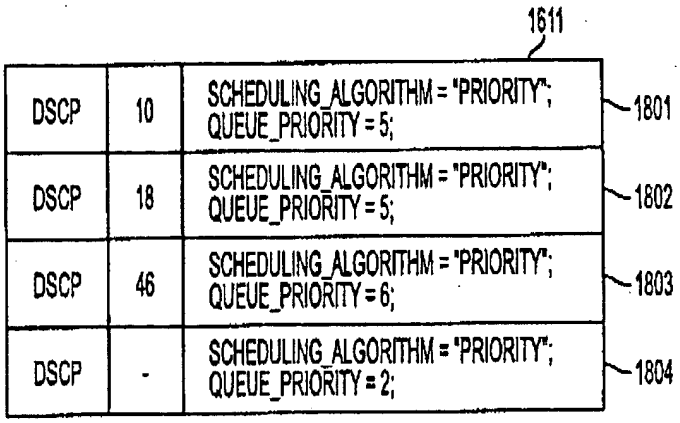
1611
DSCP
10
SCHEDULING_ALGORITHM = "PRIORITY";
QUEUE_PRIORITY = 5;
1801
DSCP
18
SCHEDULING_ALGORITHM = "PRIORITY";
QUEUE_PRIORITY = 5;
1802
DSCP
46
SCHEDULING_ALGORITHM = "PRIORITY";
QUEUE_PRIORITY = 6;
1803
DSCP
-
SCHEDULING_ALGORITHM = "PRIORITY";
QUEUE_PRIORITY = 2;
1804

FIG. 18

REPLACEMENT SHEET
Appln. Filing Date: April 26, 2001
Title: METHOD AND SYSTEM FOR CONTROLLING A POLICY-BASED NETWORK
Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 16 of 21

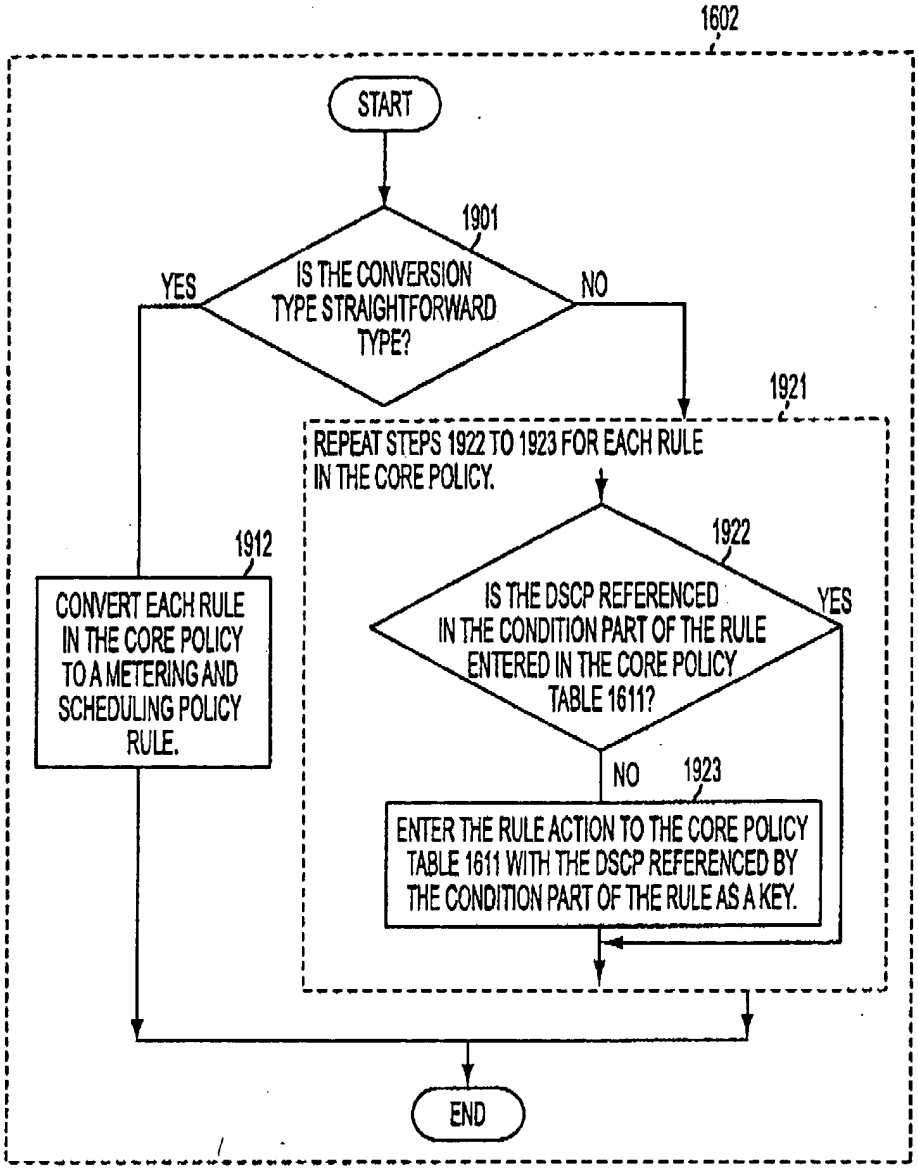

FIG. 19

Appln. Filing Date: April 26, 2001
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Inventor(s): Yasusi Kanada et al.
Appln. No.: 09/842,130 Sheet 17 of 21

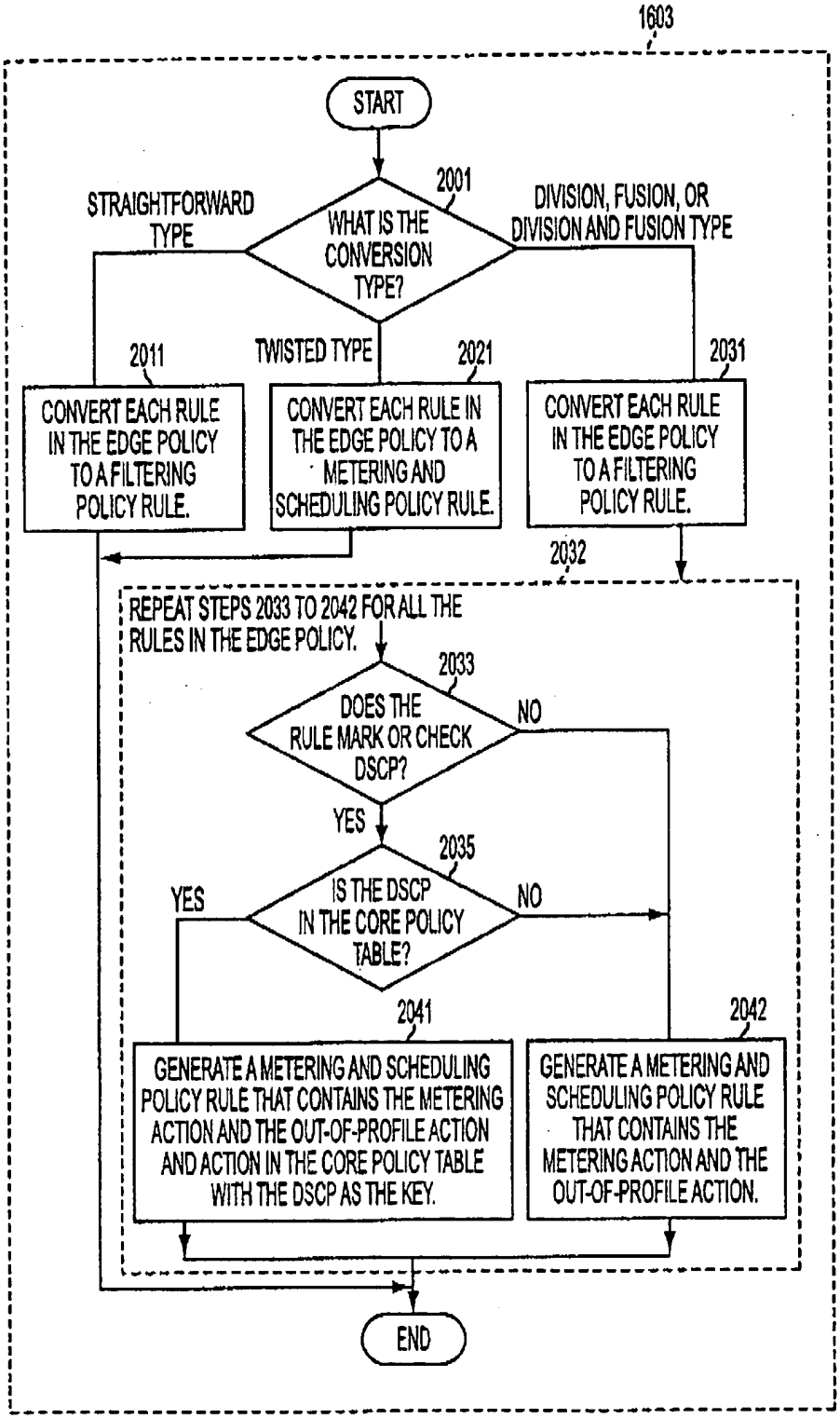

FIG. 20

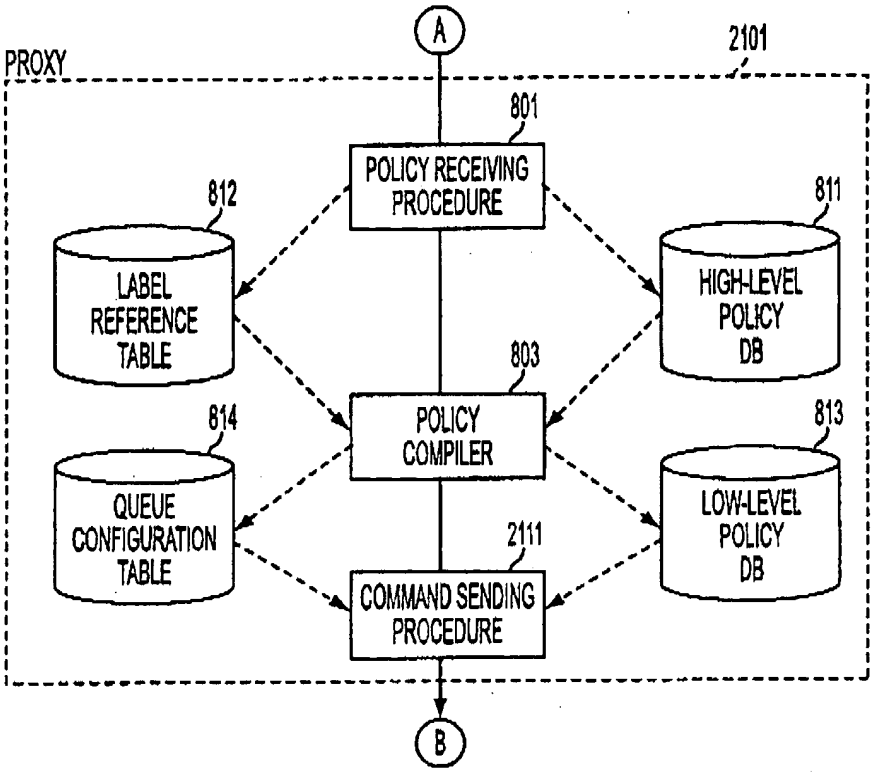
A
2101
PROXY
801
POLICY RECEIVING PROCEDURE
812
LABEL REFERENCE TABLE
811
HIGH-LEVEL POLICY DB
803
POLICY COMPILER
814
QUEUE CONFIGURATION TABLE
813
LOW-LEVEL POLICY DB
2111
COMMAND SENDING PROCEDURE
B

FIG. 21A

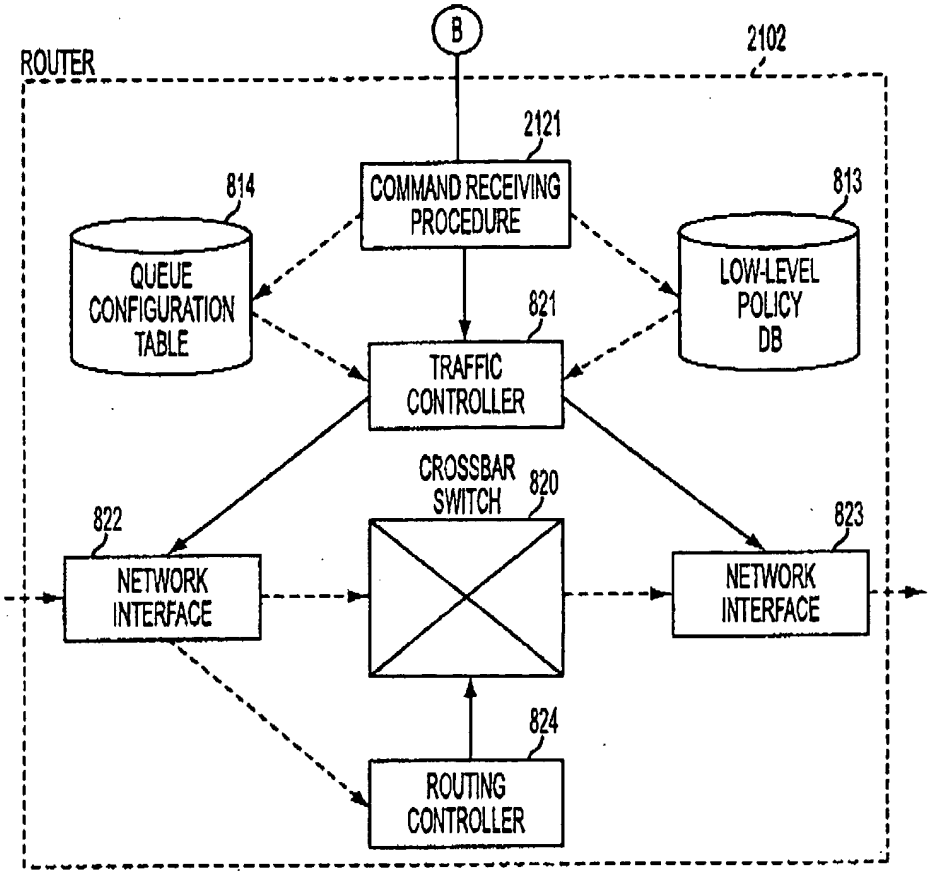
B
ROUTER
2102
2121
COMMAND RECEIVING PROCEDURE
814
QUEUE CONFIGURATION TABLE
813
LOW-LEVEL POLICY DB
821
TRAFFIC CONTROLLER
CROSSBAR SWITCH
820
822
NETWORK INTERFACE
823
NETWORK INTERFACE
824
ROUTING CONTROLLER

FIG. 21B

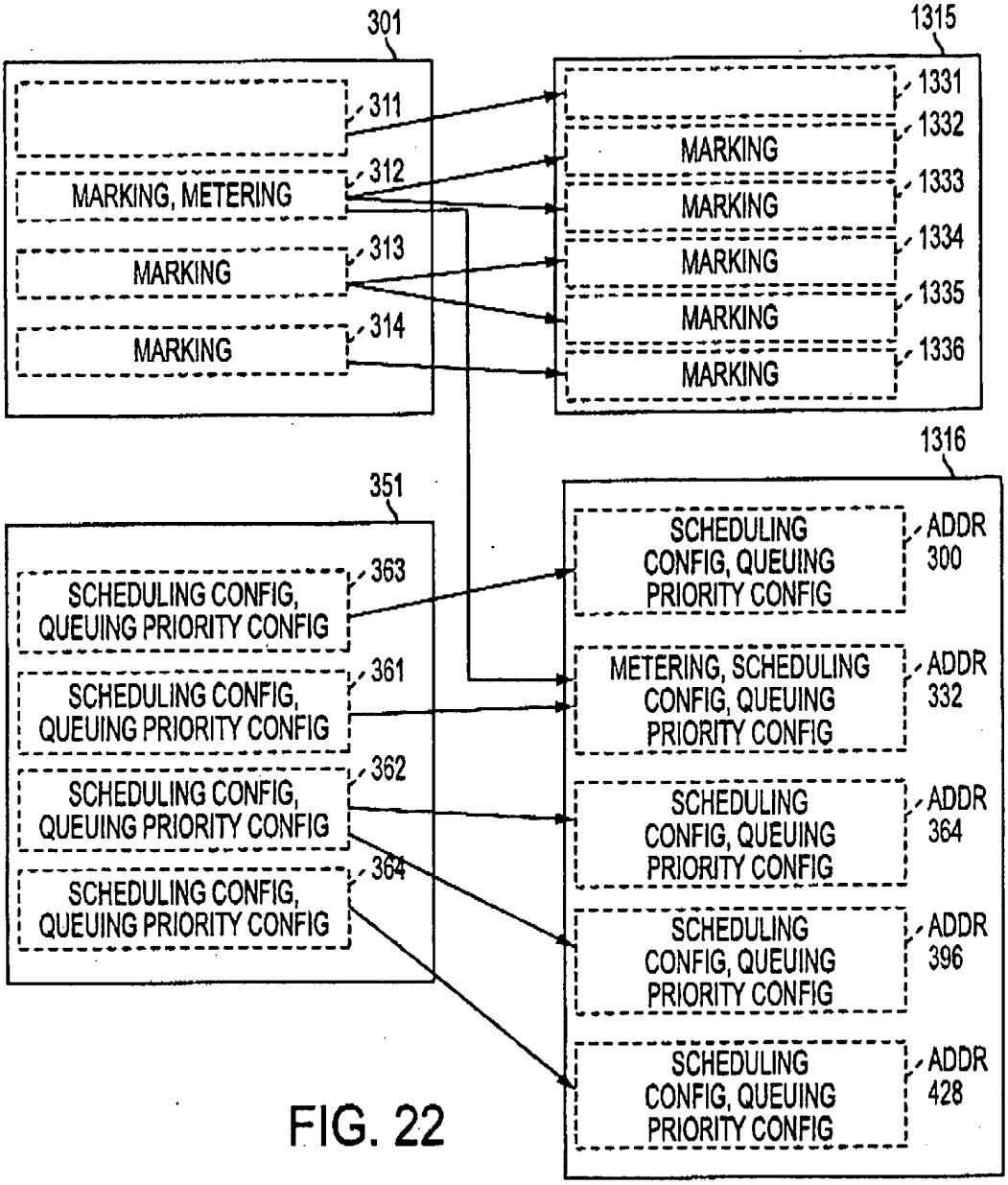
301
311
312
MARKING, METERING
313
MARKING
314
MARKING
1315
1331
1332
MARKING
1333
MARKING
1334
MARKING
1335
MARKING
1336
MARKING
1316
351
363
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
361
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
362
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
364
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
ADDR 300
METERING, SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
ADDR 332
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
ADDR 364
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
ADDR 396
SCHEDULING CONFIG, QUEUING PRIORITY CONFIG
ADDR 428

FIG. 22

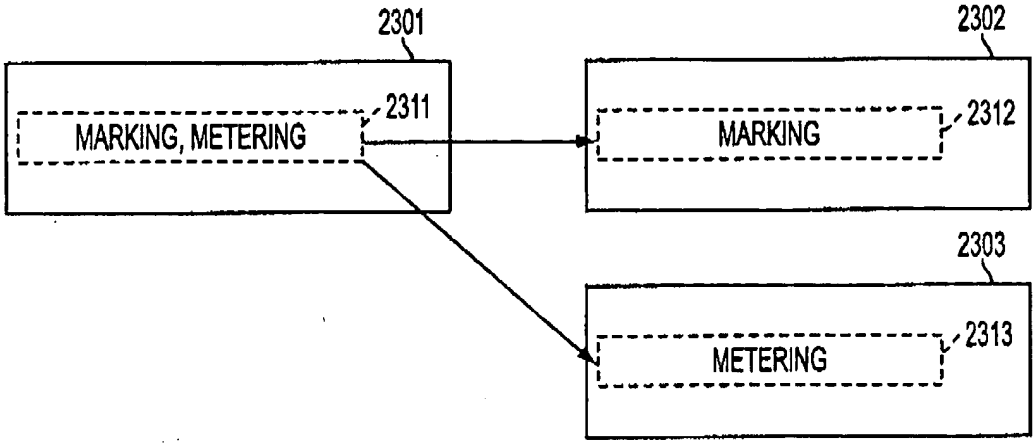

FIG. 23A

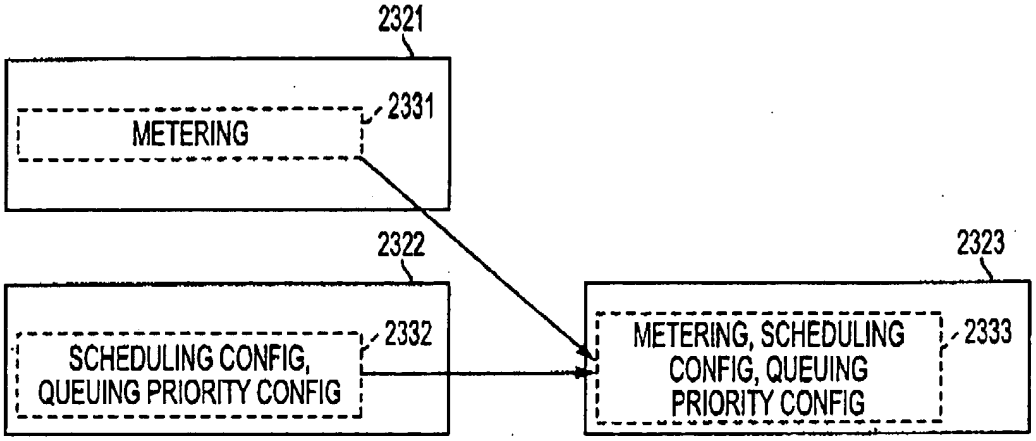

FIG. 23B